member-es-before THM

```
⊢  ∀the_es:ES, e',e:E. (e ∈ before(e')) ⟺ (e <loc e')
| by LocLessInd THEN Analyze 0 THEN RecUnfold `es-before` 0
|    THEN
|    SplitOnConclITE
|
|\
| .....truecase .....
| 1. the_es : ES
| 2. WellFnd{i}(E;x,y.(x <loc y))
| 3. j : E
| 4. ∀k:E. (k <loc j) ⇒ (∀e:E. (e ∈ before(k)) ⟺ (e <loc k))
| 5. e : E
| 6. first(j)
| ⊢  (e ∈ nil) ⟺ (e <loc j)
|   by Inst
|      Thm* ∀the_es:ES, j,e:E. first(j) ⇒ ¬(e <loc j)
|      {es_DASH_first_DASH_implies}
|      [the_es;j;e]
|      THEN
|      ObviousContradiction [-1]
|
.\
. .....falsecase .....
. 1. the_es : ES
. 2. WellFnd{i}(E;x,y.(x <loc y))
. 3. j : E
. 4. ∀k:E. (k <loc j) ⇒ (∀e:E. (e ∈ before(k)) ⟺ (e <loc k))
. 5. e : E
. 6. ¬first(j)
. ⊢  (e ∈ before(pred(j)) @ [pred(j)]) ⟺ (e <loc j)
. | by InstHyp [pred(j);e] 4
. |    THEN
. |    Try
. |    (BackThru
. |     Thm* ∀the_es:ES, j:E. ¬first(j) ⇒ (pred(j) <loc j)
. |     {es_DASH_pred_DASH_locl})
. |    THEN
. |    RWO
. |    Thm* ∀the_es:ES, e,e':E.
. |         (e <loc e')
. |         ⟺
. |         ¬first(e') & e = pred(e') ∈ E ∨ (e <loc pred(e'))
. |    {es_DASH_locl_DASH_iff}
. |    0
. |    THEN
. |    RWO
. |    Thm* ∀x:T, l1,l2:T List. (x ∈ l1 @ l2) ⟺ (x ∈ l1) ∨ (x ∈ l2)
. |    {member_append}
. |    0
. |    THEN
. |    RWO
. |    Thm* ∀l:T List, a,x:T. (x ∈ [a / l]) ⟺ x = a ∨ (x ∈ l)
. |    {cons_member}
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. |    0
. |    THEN
. |    RWO Thm* ∀x:T. (x ∈ nil) ⟺ False    {nil_member} 0
. |
. 1. the_es : ES
. 2. WellFnd{i}(E;x,y.(x <loc y))
. 3. j : E
. 4. ∀k:E. (k <loc j) ⇒ (∀e:E. (e ∈ before(k)) ⟺ (e <loc k))
. 5. e : E
. 6. ¬first(j)
. 7. (e ∈ before(pred(j))) ⟺ (e <loc pred(j))
. ⊢  (e ∈ before(pred(j))) ∨ e = pred(j) ∨ False
.    ⟺
.    ¬first(j) & e = pred(j) ∨ (e <loc pred(j))
.   by Auto THEN SplitOrHyps THEN ThinTrivial
.      THEN
.      Try (OrRight THEN Trivial)
.      THEN
.      Try (OrLeft THEN Trivial)
.      THEN
.      Try ((OrRight THEN OrLeft) THEN Trivial)
END
```